



**Environmental
Resources
Management, Inc.**

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10 September 1985

Mr. Timothy T. Travers
Compliance Officer
CERCLA Remedial Enforcement
U.S. EPA, Region III
841 Chestnut Building
Philadelphia, Pennsylvania 19107

Dear Mr. Travers:

As requested, I am pleased to submit a representative listing of ERM's qualifications and experience regarding the conduct of Remedial Investigations/Feasibility Studies. I have also enclosed a copy of our company brochure and professional profiles for Rudy Schuller and myself.

As you can see, ERM has been very actively involved with the Superfund program, with a number of projects currently underway in both EPA Region II and Region III offices. Should you feel that additional discussion is necessary, please do not hesitate to contact me.

Very truly yours,

Ronald A. Landon, P.G.
Principal

RAL/scs

Enclosures



Ronald A. Landon, P.G.

Principal

Registration

Registered Professional Geologist in Delaware and Georgia,
Certified in Indiana and Virginia

Fields of Competence

Management, direction, and quality assurance of hydrogeologic projects; hydrogeologic assessment and environmental impact of existing and proposed waste disposal facilities with emphasis on hazardous waste facilities; ground water resource and flow system analysis, delineation, recovery and containment of hydrocarbon and hazardous material spills; photogeologic interpretation; and expert testimony.

Experience Summary

Over 20 years of diversified experience with regulatory agencies and consulting firms; formulation of regulatory policy; project execution in the areas of ground water resource evaluation, development and management; solid/liquid waste disposal siting, pollution assessment, and remedial action.

For a leading international environmental consulting firm, had responsibilities as Project Manager and Department Manager, client development, proposal contract negotiations, scheduling, technical execution, supervision and financial controls.

Credentials

B.S. Geology and Mineralogy, Pennsylvania State University
1961

M.S. Geology (Hydrogeology), Pennsylvania State University,
1963

Professional Affiliations

American Institute of Professional Geologists

Association of Engineering Geologists

National Water Well Association

Key Projects

- Management and direct participation of RCRA and Superfund site investigations.
- Hydrogeologic site evaluation and characterization of secure hazardous waste disposal facilities in numerous states, including presentation at state/public hearings.
- Development of hydrogeologic criteria for the regional (statewide) screening and siting of industrial waste management facilities.
- Assessment of need, design, and installation of ground water monitoring networks at landfills, lagoons, and closed waste facilities (RCRA and state-specific).
- International state-of-the-art assessment of waste disposal permit practices, authored *Pollution Prediction Techniques for Waste Disposal Siting*, with emphasis on hazardous wastes for EPA Division Hazardous Waste Management.
- Hydrogeologic characterizations and assessment for numerous landfills in the mid-Atlantic states with leachate management design ranging from natural attenuation to collection and treatment.
- Delineation of the subsurface occurrence of hydrocarbon products or spills, and assessment of the hydrogeologic controls on mitigation and recovery from facilities ranging from gas stations to major storage/transshipment operations, including the U.S. Naval Station at Norfolk.
- Location, construction supervision, and hydrogeologic assessment of safe yield for numerous high capacity wells for industrial, municipal, and recreational use.

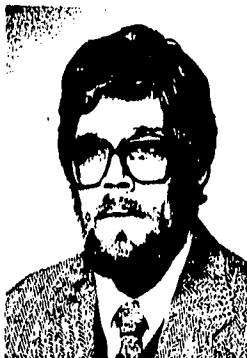
Technical Publications

Author and co-author of numerous papers dealing with solid waste management, plus numerous papers given at technical meetings.

Honors and Awards

C.P. Holdredge Award by Association of Engineering Geologists (1972) for most significant technical contribution (co-authored) to the literature entitled *Hydrogeology of Solid Waste Disposal Sites in Northeastern Illinois*.

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Rudolph M. Schuller

Fields of Competence

Inorganic and organic contaminant migration studies including geochemical modeling to determine migration patterns and controls on inorganic constituent concentrations in subsurface environments. Characterization and interpretation of potential hazards from industrial/hazardous waste facilities and coal-related solid wastes. Development of ground water sampling techniques for organic and inorganic constituents in both the saturated and unsaturated zones.

Experience Summary

Five years as a geochemist with the Illinois State Geological Survey. Developed methods for the collection of representative ground water quality data and procedures for generating laboratory leachates from coal solid wastes. Two years as a Project Manager with an environmental consulting firm managing a wide variety of investigations at industrial and hazardous waste disposal sites including site assessments and remedial action designs. Managed a variety of projects under the U.S. EPA Underground Injection Control Program.

Credentials

B.S. Geology, Youngstown State University, 1973

M.S. Geology, Wright State University, 1976

Key Projects

- Principal investigator on a variety of U.S. EPA funded research projects on the potential hazards of coal-related solid wastes.
- Developed methods for the U.S. EPA for collecting representative water quality data from monitoring wells and suction-vacuum lysimeters.
- Presented training seminars to U.S. EPA Region V technical personnel on ground water sampling and contaminant migration.
- Prepared a manual for assessing the impact of municipal waste disposal sites on ground water.
- Development, implementation, and supervision of contamination assessment programs for industrial clients in over 10 states.
- Prepared and conducted an environmental assessment of the No. 1 superfund site in Ohio.
- Served as Quality Assurance Officer for superfund projects in Ohio, New York, and New Jersey.
- Studied the long-term effects of surface sealing of a municipal landfill in Connecticut.
- Conducted assessments of the contamination potential of all classes of injection wells as part of the U.S. EPA UIC Program.

Professional Affiliations

American Institute of Professional Geologists
National Water Well Association, Technical Division
Technical Editor for Ground Water Monitoring Review

Publications

Author and co-author of over 25 publications and/or presentations dealing with the geochemical aspects of waste disposal and ground water quality.

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ERM EXPERIENCE WITH RAMPS, RI/FS AND RELATED PROJECTS

U.S. District Court

Indiana

ERM has been retained by the trustee of a federal bankruptcy court in Chicago to inventory and assess health and environmental hazards at an abandoned refinery. Our work to date has included:

1. Completion of a preliminary environmental engineering evaluation of the site to identify environmental hazards, if any, associated with its present condition.
2. Determination of immediate actions required to eliminate, control, or otherwise correct any environmental hazards that pose an immediate risk or hazard to the environment or surrounding area.
3. Completion of an intensive inventory and sampling program to determine materials contained, and uncontained, on and under the site. This effort entailed field collection of environmental data for several hazardous materials, including asbestos, PCB's, oils, leaded gasoline, and other chemicals.
4. Preparation of an engineering report recommending interim and long-term measures determined to be necessary to abate environmental risks or hazards associated with the refinery.

All of this work was completed under a severe time constraint. Future work will likely involve refinement of remedial recommendations and cost estimates, and management of coordination of on-site remedial activities.

U.S. District Court

Missouri

ERM has been retained as technical expert to the Special Master in reviewing proposed investigative and remedial programs proposed for cleanup of uncontained hazardous materials which have contaminated soil and ground water at the site of an abandoned commercial hazardous waste treatment operation. Our work entails reviewing and coordinating proposals from multiple respondents and their technical representatives and interpretation of technical issues for the Special Master.

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Confidential Client

Indiana

ERM is currently assisting a major manufacturer in a mid-size city in defining the extent of uncontrolled contamination from past waste disposal practices. Organic solvents and heavy metal sludges had been dumped at approximately 15 sites in permeable soils around the city for 30 to 40 years. ERM's involvement to date has included:

1. Definition of the potential scope of the problem, hydrogeologic analysis of the area, historical review of air photos to determine the extent and duration of use at each site, and physical inspection of the sites.
2. Assistance to legal counsel in formulating strategy with regard to Superfund reporting.
3. Design and completion of a large sampling program for area drinking water wells and analysis of the results in formulation of recommendations for further action.

Subsequent phases of this work may include:

1. Site specific definition of subsurface conditions and extent of contamination.
2. Evaluation of on- and off-site ground water and soil treatment/disposal options.
3. Development and recommendation of recovery and restoration alternatives.

USEPA

Illinois

Two ERM principals worked with the USEPA Region V in reviewing available data and former studies pertaining to a PCB-contaminated area adjacent to a machinery manufacturing facility. Some of the contaminated area is submerged in shallow water. These efforts included the following:

1. Locate and collect additional soil borings to better define the extent of PCB contamination in shallow surface water and bottom muds adjacent to the manufacturing facility.
2. Identify strategies for ultimate disposal of PCB-contaminated muds other than secure

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landfilling, as proposed. Alternatives considered were in-situ stabilization and solvent extraction of PCBs from the muds with subsequent oxidation/destruction.

3. Layout and design of a temporary retaining dike around source contaminant area.

Confidential Client

Minnesota

ERM has recently completed work for a corporation that purchased a portion of a former wood preserving site and built an office/manufacturing complex. Shallow soils and ground water are highly contaminated with polynuclear aromatics. The extent and magnitude of the contamination is well documented by soil borings and monitoring wells around the site. Remedial strategy is complicated by the fact that a portion of the site is owned by another company who also built a new facility, and a third party, an existing corporation, who owned the former wood preserving company.

Our involvement to date has included:

1. Literature review of coal tar refining and wood preserving processes, with particular attention to likely waste disposal methods and quantities.
2. Integration and interpretation of large amounts of existing data and preparation of a graphical summary to better understand the extent of the problem and its relationship to former wood preserving operations.
3. Assistance to legal counsel in formulating strategy with regard to superfund regulations, remedial action alternatives, and litigation by present owners.
4. Preparation of a remedial action plan, to include strategy for additional sampling, site preparation and restoration plan development, treatment, storage, transportation, and disposal plan development, with associated security and safety planning.

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Major Electronics Industries
(Generator Committee)

Minnesota

ERM has been selected from a short list of major national consulting firms, on the basis of technical presentation and interview. The work includes representing the committee in its efforts to investigate and propose remedial alternatives for cleaning up two abandoned metal and solvent recovery/recycling facilities in the Twin Cities metropolitan area. These are sites to which these industries sent wastes and now pose a potential hazard to the surrounding neighborhood.

U.S. EPA

St. Louis Park, Minnesota

Three ERM principals worked with the USEPA Region V in reviewing available data and former studies pertaining to the Riley Tar and Chemical Wood preserving site in St. Louis Park. These efforts included the following:

1. Review of the physical/chemical processes available for removal of polynuclear aromatics from ground water proposed to be pumped from high-volume interceptor wells.
2. Review of existing data from bench- and pilot-scale adsorption and oxidation attempts at PAH removal.
3. Review with regard to adequacy of existing data in defining scope of contamination and source area.
4. Review with regard to remedial strategies proposed to date.

Confidential Client

Michigan

A ground water monitoring well downgradient from an automotive manufacturing facility showed contamination by plating wastes, including cyanide, nickel, and chrome. Upon identification of the contamination, a series of other wells were drilled adjacent to and around the manufacturing property line, to determine the radial extent and degree of contamination that had occurred. The extent of the ground water plume was defined and investigation continued to determine: 1) the appropriate corrective action for intercepting ground water prior to it leaving the plant property, 2) the source of contamination, and 3) the relative benefits and costs of alternative ground water treatment systems being considered.

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The source of contamination was found to be leaking plating tanks in the basement of the manufacturing facilities, which were drained and sealed to prevent further contamination. Additionally, a monitoring system was installed so that any future leaks would be identified immediately. A remedial action program which was implemented included the construction of a french drain system to intercept ground water from the manufacturing facility. Contaminated ground water was pumped continuously and piped to the manufacturing plant's wastewater treatment system. An analytical program was instituted to determine when the ground water had reached a quality consistent with acceptable water quality standards.

Confidential Client

Illinois

A railroad derailment caused a large spill of acetone cyanohydrin and butyl acrylate. Rapid areal containment was achieved, but seepage into the ground water table occurred. After a hydrogeologic assessment of the area, interceptor wells were strategically placed and pumped to a makeshift treatment plant. The treatment consisted of cyanide removal in modified boxcars and aerobic biological degradation in temporarily constructed lagoons, with discharge to a nearby creek.

Confidential Client

Minnesota

This landfill was under public pressure to have renewal of its operating permit disapproved because of solvents which were being picked up in peripheral monitoring wells. A literature review of published priority pollutant data from landfill leachate did not implicate the landfill and led to a wider search for another source. Site hydrogeology led upgradient to a nearby airport where it was found that solvents were used at repair facilities and disposed of in unsealed sumps. Further evaluation led to the conclusion that the airfield facilities were probably the source of the contaminants. Oral presentations of this case to regulatory officials and to a public hearing eliminated this issue from the permit renewal decision. It now appears that the renewal will receive approval.

Pig Road Pits Superfund Site

San Jacinto County, Texas

Occidental Chemical Corporation, acting through its attorneys, has retained ERM to conduct a seven-phase closure action at this site in East Texas. This abandoned waste site contained a viscous, low pH organic tar and contaminated storm water in six earthen pits. ERM conducted an in-depth Site Investigation and

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Evaluation of Remedial Alternatives as part of Phase I. Based on a careful review of the site hazard ranking score (HRS), ERM and the clients' attorney succeeded in having this site removed from the proposed additions to the National Priorities List under CERCLA.

The Site Investigation included sampling and analyses of the ground water, pit tar, ponded rainwater, and adjacent soil to determine volumes of hazardous waste, the pathways of migration and the extent and direction of areal contamination. Using information from the investigation and defined remedial objectives, ERM prepared a concise alternatives analysis for the expeditious closure of the tar pits with the least long-range environmental impact.

ERM provided immediate remedial measures, prepared detailed plans and specifications for the approved remedial alternative, provided construction bidding and recommended contract award, provided construction surveillance, and certification of completion of closure. Considerable assistance with regulatory interface and negotiations with the site landowners has been provided. This site is the first NPL site in Texas to be remediated.

Bayou Sorrel Superfund Site

Iberville Parish, Louisiana

ERM has been engaged by a Task Force of Principal Responsible Parties (PRP's) at the Bayou Sorrel Superfund site in Iberville Parish, Louisiana to perform the Remedial Investigation/Feasibility Study (RI/FS) of the site. While the PRP's originally intended this effort to be in lieu of an EPA contractor performing the work, it was actually performed in parallel with EPA's contractor.

Hazardous waste accumulated at this remote site as part of a joint hazardous waste treatment system operated by EPA, Inc. and CLAW, Inc. in the 1970's. CLAW, Inc. operated an injection well, and EPA, Inc. operated a landfill. The liquid residuals from the landfill were deep well injected and the solid residuals from the injection well were disposed of in the landfill. In addition, the joint operation received the residuals from other hazardous waste disposal facilities throughout the mid-U.S. The EPA, Inc. site includes 50 acres of disposal ponds and landfills scattered over an area of about one-half square mile.

Immediate remedial measures were completed by ERM. A clay cap placed over the site after it was closed was eroded. To reduce surface impacts, the cap was repaired and revegetated.

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During the remedial investigation phase, three borings and seven ground water monitoring wells were installed to supplement the existing ground water monitoring well system. Samples were taken from waste, affected soil, storm water runoff, standing water, fish, crawfish, rabbits, river and lake sediments, and water. This data was analyzed to evaluate pathways, the extent of migration, possible target receptors, and summarized in a remedial investigation report. The feasibility study developed and evaluated alternatives for site remediation. The lowest cost alternative which met the requirements of the National Contingency Plan as recommended. Negotiations with EPA are continuing as they finish their RI/FS.

Bio-Ecology Superfund Site

Grand Prairie, Texas

ERM was retained by Thompson & Knight, Attorneys and Counselors, to review the Site Investigation and Feasibility Study reports prepared for TDWR and EPA for the Bio-Ecology Site in Grand Prairie, Texas. The review was done on behalf of industries potentially responsible for restoration of the closed site. The ERM team of engineers and hydrogeologists reviewed the reports in detail.

ERM analyzed the data collected by the agencies' consultant and data from site visits and prepared an independent set of conclusions and recommendations. The ERM recommended remedial alternative had a capital cost of \$850,000 compared with EPA's \$2,350,000, and the report demonstrated that the less expensive alternative would be more effective. ERM's recommended alternative was presented to TDWR and EPA and defended in oral discussions.

EPA's record of decision (ROD) rejected the region's recommended solution and opted instead for the more expensive on-site RCRA vault. ERM is now assisting Thompson & Knight with negotiations relative to implementing a modification of the ROD remedial plan.

Petro-Processors Superfund Site

Baton Rouge, Louisiana

ERM personnel assisted three major chemical companies in preparing technical cost considerations for this site. These considerations involved litigation relative to the allocation of a \$50 million surface cleanup costs at the large, complex Superfund Site.

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Naval Weapons Industrial Reserve Plant

McGregor, Texas

A confidential industrial client has retained ERM through the law firm of Baker & Botts to provide engineering for the remediation of an old pesticide dumping area on the Naval Weapons Industrial Reserve Plant (NWIRP) in McGregor, Texas. This area contains DDT, toxaphene, and other pesticides dumped in the 1950s. The Navy has conducted the necessary remedial investigation and has asked, via a Department of Justice suit, that the pesticides and contaminated soil be cleaned up within a defined area.

The concentrated pesticide residue at the surface of the soil was excavated and removed for off-site disposal. This allowed remediation alternatives to be considered for the remaining contaminated soil. Six ground water monitor wells were installed and extensive soil sampling and analyses were performed. Alternatives being evaluated include additional off-site disposal, consolidation and capping of the soil in its present location, RCRA vault, and in-situ biological treatment. The capping and biological treatment alternatives are significantly less costly than complete off-site disposal.

ERM is evaluating the closure alternatives and will prepare detailed plans and specifications for the approved alternative.

Lamar County Sites

Paris, Texas

In late 1984, EPA issued an administrative order to 24 potentially responsible parties (PRP's), requiring them to submit a plan within 30 days and then finish the clean up of two abandoned sites located in Paris, Texas within 10 days. These sites contained some 322 drums containing varying amounts of paint sludges, resin, solvents, and water. Additionally, there was a concrete vat containing paint sludge, a tank trailer containing sludges and solvent, and contaminate soil.

ERM was retained by a group of PRP's nine days before the removal plan was due to be submitted to EPA. ERM prepared the removal plan, submitted it to the client, and then submitted the plan to EPA. The plan, which proposed a 58 day clean-up schedule, was approved by EPA. ERM then completed the following tasks:

- Field Sampling/Analysis/Quantification of the two sites
- Preparation of a Bid Package
- Solicitation of Bids, Recommendation of Contractor, Award of Contract

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- On-site Engineering Representation and contract Administration
- Agency Liaison
- Project Completion Report

The work was completed two days ahead of schedule, 11 percent under budget, and 64 percent below the lowest quote obtained by the Cooperating Parties prior to retaining ERM.

Confidential Computer Component Mfg.

Sunnvale and Mountain View, California

ERM is currently working at sites in the Santa Clara Valley for a confidential client to determine the potential solvent contamination of ground water. Recent transfers of ownership of the facilities require involvement of both former and present owners. Ground water at two of the sites is known to be contaminated with TCE, Freon, and other synthetic organics. ERM is installing ground water monitoring wells and gathering data needed to prepare a Remedial Action Plan to mitigate the ground water contamination.

Westinghouse Electric Company

Emeryville, California

ERM provided hydrogeologic and engineering services to Westinghouse in support of a site cleanup in Emeryville, California. The work involved assistance in negotiation of a Consent Agreement with EPA Region IX, as well as specific field services to establish the extent of contamination. The Emeryville site consists of a 2-acre parcel adjacent to a manufacturing/warehouse facility. PCB concentrations over 30,000 mg/kg were found in samples of surface soil, and high concentrations were found in various "hot spots" to depths of 30 feet. Ground water monitoring was provided to demonstrate that PCB's were not migrating off site. This project involved Phase I (investigation and definition of contamination plume) and Phase II (PCB cleanup) operations.

Confidential Electronics Equipment Mfg.

Palo Alto, California

Two projects involving underground tank leakage were undertaken for this client. Each project required soil sampling and borings and ground water testing to determine the extent of contamination. One project included tank excavation, soil testing, and site closure.

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Confidential Ink Mfrg.

South Bay Area, California

This project involved property where ink residues were dumped indiscriminately on surface soils at the facility. Engineering services were provided for surface and subsurface investigation, including soil sampling, to determine heavy metal contamination.

Confidential Semiconductor Mfrg.

Sunnyvale, California

This project required definition of lateral and vertical extent of a contamination plume. A soil sampling device was developed to expedite field and lab work to help maintain the construction schedule for excavating an underground leaking tank. Enforcement agency negotiations also were involved for tank closure.

Confidential Electronics Components Companies

Santa Clara Valley, California

This is a joint project of a group of electronics companies undertaken in response to a Regional Water Quality Control Board edict to define a contaminated ground water plume at an EPA National Superfund Priority List Site. Engineering services included soil sampling, determining lithology, installing monitoring wells, analyzing soil gases and ground water samples, characterizing and defining the contamination plume, and preparing a Remedial Action Plan.

Confidential Electrical Products Mfrg.

Palo Alto, California

This project involved site investigation for PCB contamination, including surface and subsurface soil sampling to determine the extent of the plume. Engineering services also included enforcement agency negotiations.

Confidential Engineering Development Laboratory

Bay Area, California

This project involved investigation of water supply contaminated with TCE. This water quality investigation lead to a follow up project involving the design of a new, deeper water supply well.

Kern County Council of Governments

As a project subcontractor, ERM is providing technical management of a study investigating the extent of volatile organic contamination of ground water in the West Bakersfield area, and

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identifying appropriate remedial measures to protect the area's drinking water supplies.

Hercules, Inc.

Wilmington, Delaware

ERM has conducted an extensive hydrogeological investigation at Hercules', Gibbstown, New Jersey manufacturing facility, in order to identify and delineate organic contamination in a complex subsurface aquifer system. The first phase defined the extent of the contaminant plume. A water quality monitoring system has been designed and installed, and is currently operating.

ERM carried out an investigation of various process alternatives for the treatment of purged ground water. This study involved the characterization of treatment process influent and effluent as a design basis; a review of proven technologies for the destruction or removal of organic contaminants in aqueous streams; and evaluation of the capacity and capability of existing wastewater treatment facilities at the plant; and a comparison of alternative management systems for treatment of contaminated ground water. Once the alternative technologies had been identified, additional tests and bench-scale treatability studies were used to determine the most suitable method.

A ground water recovery system has now been designed and installed to recover and treat affected ground water. The existing biological treatment plant at the facility is being upgraded to treat ground water and discharge it through a NPDES-permitted discharge point.

Allied Amphenol-Bendix Connector Operations

Sidney, New York

Previous studies had indicated that the former Hill Site disposal pit, which had received spent solvents and waste oils containing PCB, was contaminating the shallow ground water on-site. ERM was retained to define the extent of migration in the deep flow system, and to determine the extent of migration off-site in the ground water flow systems. ERM also defined the extent of migration of PCB in surface waters.

ERM assessed the remedial alternatives, which include recovery wells in glacial overburden or in bedrock for volatile organics, natural flushing for volatile organics, and a shallow interceptor trench or a cost-effective remedial action was developed. ERM prepared a secure closure design for the pit, which was used by Allied Amphenol for final closure.

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John A Roebling Steel Company

Trenton, New Jersey

A Remedial Action Master Plan (RAMP) for the John A. Roebling Steel Company site was prepared in accordance with the rules of the National Oil and Hazardous Substance Contingency Plan. The site is a 200-acre partially abandoned industrial facility used for steel production and wire fabrication since the early 1900s. The current site owner ceased activity on the site in June 1981.

The site contains numerous sources of hazardous materials and wastes. These include two inactive sludge lagoons, steel furnace slag, emission control (baghouse) dust, electrical transformers containing PCB oil, as well as various tanks and drums containing oil and other potentially hazardous substances. An abandoned landfill is also located on the site. Ground water monitoring wells were required to determine the extent of ground water degradation. Wells were located upgradient and downgradient of individual potential pollutant sources. Air monitoring was required to establish the appropriate level of personnel protection equipment. Air monitoring during on-site excavations was also necessary. A soil sampling program was required to determine the volume and extent of contaminated soils at the site. Samples were collected both at the surface and at depth.

Remedial actions included on-site source control measures; off-site remedial measures were not required. Source control measures (appropriate for the hazardous substances which remained at or near the original disposal area) included contaminated soil and waste removal and disposal, waste containment, and surface controls.

Evor Phillips Leasing Company

Middlesex Co., New Jersey

ERM prepared a Remedial Action Master Plan (RAMP) for the Evor Phillips Leasing Company site, which was alleged to have been used for direct discharge to the ground of bulk liquid wastes, burial of drums, and briefly for treatment ponds. After reviewing the (relatively sparse) information available about the site, ERM reviewed and evaluated the most likely remedial actions, including a soil and ground water sampling program, removal and treatment or disposal of contaminated soils, and measures to prevent further contamination.

Delaware Department of Natural Resources

Dover, Delaware

ERM hydrogeologists are providing third-party review of NUS Corporation's Remedial Investigation/Feasibility Study of the Tybout's Corner Landfill site, south of Wilmington, Delaware.

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ERM has attended project meetings and reviewed reports concerning:

- Ground water monitoring plan
- Location and drilling of monitoring wells
- Monitoring of ground water levels and quality
- Sampling and analysis of surface and ground water and sediment
- Analysis for contamination in water supply wells
- Feasibility study for alternative water supply
- Data collection and evaluation
- Remedial measures for clean of ground water
- Community relations
- Environmental assessment for the site vicinity
- Financial and schedule status of the project

ERM has assisted in evaluating technical questions such as the actual extent of contaminant migration in ground water and issues such as the desirability and cost of the use of existing public water supplies as alternatives to water wells, the effect of remedial measures on currently uncontaminated ground water.

Drinker, Biddle & Reath

Philadelphia, PA

ERM performed an independent review of site assessments of the Wade Site performed by the U.S. EPA and its contractors, examining data on soils, ground water, surface water and air contamination. The technical problem was to determine the fate of phthalate esters used as plasticizers in vinyl chloride monomers: whether the former could have migrated out of waste materials, and to what extent they might have degraded the environment. ERM provided an independent judgment of this question, then followed up by providing expert testimony for litigation.

Velsicol Chemical Company

Memphis, Tennessee

Velsicol Chemical requested that ERM perform a comprehensive investigation on an inactive disposal site in Hardeman County,

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Tennessee. Velsicol has used the site for disposal of still bottoms and spent catalysts used in the manufacture of pesticides - carbon tetrachloride was a principal contaminant of concern.

The project required the design of monitoring networks, sampling and analysis of air quality, surface and ground water quality. It also required ground water transport and surface transport predictions and biological investigations. ERM used a USGS two-dimensional solute transport program for modeling ground water contaminant flow and for predicting the fate of the plume - in particular, for assessing the likelihood of ground water discharge to a nearby stream. ERM also assessed and provided the conceptual design of appropriate remedial measures, principally including a clay cap which was installed over the site to prevent further infiltration. Further measures may include the installation of wells along a nearby stream to monitor for possible contamination from carbon tetrachloride.

Confidential Client

New Jersey

ERM is conducting a Remedial Investigation/Feasibility Study for a responsible party at a National Priority List (Superfund) site in New Jersey. Preliminary field investigations have shown that significant concentrations of volatile organic compounds are present in the ground water and soils beneath the site. The Remedial Investigation will include installing monitoring wells; collecting soil, sediment and surface water samples; and conducting aquifer tests. Comprehensive, site-specific Quality Assurance/Quality Control and Health and Safety Plans are being prepared for the project. The data obtained from the Remedial Investigation will be used in conducting the Feasibility Study, which will assess the potential alternatives for cleaning up the site.

Fisher Scientific Company

Somerville, New Jersey

Fisher retained ERM to conduct a hydrogeologic investigation in order to define and evaluate ground water contamination in the vicinity of its Bridgewater Packaging Facility, which receives chemicals by rail and truck shipment and stores them on site. After characterizing the area's geology and hydrogeology, ERM undertook an extensive ground water and soil sampling program involving both monitoring and water supply wells. Using fracture trace analysis and aerial photographs, ERM defined the shape and direction of the contaminant plume. Finally, ERM evaluated and presented a set of alternative remedial actions in a final report to Fisher.

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